Pap Smear Abnormalities in Women Admitted to a Tertiary Health Center in Southeast Turkey

Türkiyenin Güneydoğusunda 3. Basamak Hastanenin Pap Smear Taramasındaki Anormal Sitolojik Sonuçlar

Pap Smear Abnormalities in a Tertiary Health Center

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Özet

Amaç: Siirt ilindeki 3. basamak hastaneye başvuran kadınlarda yapılmış olan Pap smear tarama testi sonuçlarının analiz edilmesiyle servikal sitolojik anormalliklerin değerlendirilmesi amaçlanmıştır. Gereç ve Yöntem: Ocak 2009 ve Aralık 2009 tarihleri arasında başvuran 3000 hastaya yapılmış olan Pap smear tarama testi sonuçları değerlendirildi. Tarama sonuçları; benign epitelyal değişiklikler, enfeksiyöz değişiklikler, ASC-US (atypical squamous cells with undetermined significance), ASC-H (atypical squamous cells of high significance), LSIL (low-grade squamous intraepithelial lesion) olarak saptandı. Bulgular: Pap smear tarama sonuçlarında benign epitelyal değişiklikler, enfeksiyöz değişiklikler, ASC-US, ASC-H, LSIL sıklığı sırasıyla 83.7%, 15.3%, 0.8%, 0.1% and 0.1% olarak belirlendi. Hastanın yaşı ve histopatolojik değişiklikler arasında istatistiksel olarak anlamlı bir korelasyon mevcuttu (r=0.072, p=0.001). Gravida ile histopatolojik değişiklikler arasında istatistiksel olarak anlamlı bir korelasyon yoktu (r=0.033, p=0.067). Parite ve histopatolojik değişiklikler arasında istatistiksel olarak anlamlı bir korelasyon bulundu (r=0.051, p=0.005). Pap smear sonuçları ile sosyoekonomik düzey (r=0.088, p=0.168), eğitim düzeyi (r=0.048, p=0.257) ve sigara kullanımı (r=0.086, p=0.077) arasında istatistiksel olarak anlamlı bir korelasyon saptanmadı. Tartışma: Mevcut çalışmada servikal sitolojik anormalliklerin prevalansı %1 olarak saptanmıştır. Bu oran, Batı Avrupa ülkeleriyle ve Amerika Birleşik Devletleri'yle karşılaştırıldığında çok düşüktür. Dolayısıyla Türk sağlık politikası belirlenirken batı ülkelerindeki çalışmaların verileri yerine ulusal veriler kullanılmalıdır.

Anahtar Kelimeler

Serviks Kanseri; Servikal Sitoloji; Servikal İntraepitelyal Neoplazi; Pap Smear; Prevalans

Abstract

Aim: To analyze the cervical cytological abnormalities which are detected in women undergoing Pap screening in a tertiary health care center within Siirt, a southeastern province of Turkey. Material and Method: A total of 3000 women who underwent Pap screening at the study center between January 1, 2009 and December 31, 2009 were recruited for the study. The women who were diagnosed with benign epithelial changes, infectious alterations, as well as atypical squamous cells with undetermined significance (ASC-US), atypical squamous cells of high significance (ASC-H), and low-grade squamous intraepithelial lesion (LSIL) were included. Results: Benign epithelial alterations, infectious changes, ASCUS, ASC-H, and LSIL were detected in 83.7%, 15.3%, 0.8%, 0.1% and 0.1% of the Pap smears respectively. A significant correlation was found between the patient age and the histopathological alterations in the Pap smears (r=0.072, p=0.001). Although no correlation could be detected between gravidity and Pap smear results (r=0.033, p=0.067), a significant correlation existed between parity and the histopathological findings within the Pap smears (r=0.051, p=0.005). Interestingly, the Pap smear results were found to be unrelated to socioeconomic status (r=0.088, p=0.168), education level (r=0.048, p=0.257), and smoking habit (r=0.086, p=0.077). Discussion: The present study has reported a value of 1.0% for the overall prevalence of cervical cytological abnormalities, which is much lower than in western countries. Thus, rather than being dependent on the data reported by clinical studies that have been conducted in western countries, Turkish health care policy should be based on the data obtained from national studies.

Keywords

Cervical Cancer; Cervical Cytology; Cervical Intraepitehalial Neoplasia; Pap smear; prevalence

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Introduction

Cervical cancer is the malignant neoplasm of the cervix uteri or cervical area. Worldwide, this disease affects about 17 per 100000 women and kills about 10 per 100000 every year. Thus cervical cancer is addressed as the fifth most deadly cancer in women. In other words, 528000 new cases of cervical carcinoma are diagnosed and 266000 deaths from cervical cancer are recorded annually worldwide [1, 2].

As for Turkey, cervical cancer is the 8th most common cancer among women in Turkey and ranks 13th among cancer-related deaths. Approximately 1686 women are diagnosed with cervical cancer and 663 patients die from this disease each year in Turkey [3-7].

It is well documented that population-wide cervical cancer screening programs that are based on the Pap test significantly reduce the incidence of cervical cancer and decrease the associated rate of mortality, especially in developed countries. In contrast, cervical carcinoma remains an important health problem for low-income countries due to the lack of such programs. Approximately 80% of cervical cancers occur in low-income countries, accounting for 15% of all cancers in women [8].

Despite the fact that a number of epidemiological studies have been published about cervical cancer, reliable data on the prevalence of cervical cytological abnormalities in Turkey are not readily available. The main reason for this inconvenience is the absence of organized mass screening programs which would facilitate the early diagnosis of cervical cancer [3-7].

On the other hand, statistical data supplied by the Ministry of Health reveal that opportunistic screening is fairly widespread in Turkey. That is, each year nearly one million Pap tests are performed in cancer screening and prevention centers funded by the Turkish government [7].

The present study aims to analyze the cervical cytological abnormalities which are detected in women undergoing Pap screening in a tertiary health care center within Siirt, a southeastern province of Turkey.

Material And Method

This retrospective study is approved by the Institutional Review Board and Ethical Committee of Siirt Women Health Hospital where the study was conducted. A total of 3000 women who presented with different clinical symptoms and who underwent Pap screening at the study center between January 1, 2009 and December 31, 2009 were recruited for the study.

The reviewed women were diagnosed with benign epithelial changes, infectious alterations, atypical squamous cells with undetermined significance (ASC-US), atypical squamous cells of high significance (ASC-H) and low-grade squamous intraepithelial lesion (LSIL) within the period of the study. High grade squamous intraepithelial lesion (HSIL), squamous cell carcinoma (SCC), or adenocarcinomas were diagnosed in none of the reviewed patients. Patients with a history of cervical, vaginal, or vulvar carcinoma were not included in the study, and in particular, patients with a history of radiotherapy and/or chemotherapy for cervical carcinoma were excluded from the analyses.

All cytological smears were collected by a wet Ayre spatula and/or an endobrush according to conventional methods, and slides were evaluated at the pathology/cytopathology unit of the study center. Routinely, Pap tests were initially screened by cytotechnicians and then further evaluated and recorded by the experienced pathologists/cytopathologists who were working at the study center. The Bethesda system was adopted for histopathological assessment of the acquired specimens [9].

Data relevant to the potential risk factors of cervical cancer were collected from patient files, pathology/cytology reports, and hospital records. Accordingly, information related to patient age, gravidity, parity, socioeconomic status (low, moderate, high), marital status, smoking history (past and current), education level (none, primary school, secondary school, high school, university) and presenting symptoms were acquired.

Collected data were analyzed by Statistical Package for Social Sciences version 11.0 (SPSS, SPSS Inc., Chicago, IL, USA). Statistical data were expressed as mean±standard deviation (range: minimum-maximum) or percentage (%), where appropriate. Descriptive methods were utilized to list the demographic and clinical characteristics of the study group. Parametric variables of more than two groups were compared by one-way ANOVA while non-parametric variables of more than two groups were compared by the Kruskal-Wallis test. On the other hand, Pearson's correlation test was used to assess the relationships among variables. $P<0.05$ was accepted to be statistically significant.

Results

The present study reviewed a total of 3000 women who underwent Pap smear screening at the study center during a one-year-period. The mean age of the reviewed subjects was 37.5±10.5 years (range: 16-74 years). Meanwhile the mean gravidity and parity of these subjects were found to be 5.2±2.8 (range: 0-15) and 4.8±2.4 (range: 0-13) respectively.

All of the reviewed patients were married and a majority of them had low socioeconomic status (2226/3000, 74.2%). The remaining patients had either moderate (608/3000, 20.3%) or high (166/3000, 5.5%) socioeconomic status. In parallel with low socioeconomic status, the majority of the reviewed patients had a primary school education (2134/3000, 71.1%). Additionally, 11.9% of the reviewed subjects (357/3000) had a secondary school education and 8.7% of them (261/3000) had a high school education. Approximately 4.0% of the reviewed patients (120/3000) were university graduates whereas 4.3% of them (129/3000) had no education. Only 78 women (2. 6%) were current smokers while 24 women (0.8%) had a past history of smoking.

The most commonly encountered clinical symptoms were, respectively, menstrual abnormality (1050/3000, 35.0%), vaginal discharge (780/3000, 26.0%), and pelvic pain (690/3000, 23.0%).

However, 16.0% of the reviewed women (480/3000) were asymptomatic.

As expected, there was a significant positive correlation between age and gravidity ($r=0.552$, $p=0.001$) and the same correlation also existed between age and parity ($r=0.595$, $p=0.001$). On the other hand, there was a significant negative correlation between age and high education level ($r=0.567$, $p=0.001$). A significant correlation was also found between the patient age and the histopathological alterations in the Pap smears

(r=0.072, p=0.001). Although no correlation could be detected between gravidity and Pap smear results (r=0.033, p=0.067), a significant correlation existed between parity and the histopathological findings within the Pap smears (r=0.051, p=0.005). Interestingly, the Pap smear results were found to be unrelated to socioeconomic status (r=0.088, p=0.168), education level (r=0.048, p=0.257), and smoking habit (r=0.086, p=0.077).

Table 1 demonstrates the Pap smear abnormalities that were detected within the study group. The benign epithelial changes and infectious alterations obviously account for the majority of the Pap smear results. Table 2 shows the demographic characteristics of the patients who were diagnosed with benign epithelial/infectious alterations, ASCUS, ASC-H, and LSIL. Accordingly, the patients with ASC-H were significantly younger and had significantly lower parity when compared to patients who were diagnosed with benign epithelial alterations, infectious changes, ASCUS, and LSIL (respectively p=0.001 and p=0.003).

Table 1. Pap Smear Abnormalities Detected within the Study Group

Pap smear abnormalities	Number (%)
Benign epithelial changes	2511 (83.7%)
Infectious alterations	460 (15.3%)
Atypical squamous cells with undetermined significance (ASC-US)	25 (0.8%)
Atypical squamous cells of high significance (ASC-H)	1 (0.1%)
Low-grade squamous intraepithelial lesion (LSIL)	3 (0.1%)
Total	3000 (100.0%)

Table 2. Demographic Characteristics of Patients with Different Pap Smear Results

Demographic Characteristics	Mean ± Standard deviation / Percent (%)	p
Age (years)		0.001*
Benign epithelial/Infectious alterations	48.9±10.5	
ASCUS	37.4±10.5	
ASC-H	24.0±0.1	
LSIL	43.3±15.3	
Gravidity		0.058
Benign epithelial/Infectious alterations	5.2±2.8	
ASCUS	6.6±1.9	
ASC-H	3.0±0.0	
LSIL	6.0±1.7	
Parity		0.003*
Benign epithelial/Infectious alterations	4.7±2.4	
ASCUS	6.4±1.9	
ASC-H	3.0±0.0	
LSIL	6.0±1.7	
Low socioeconomic status		0.660
Benign epithelial/Infectious alterations	75.0%	
ASCUS	73.2%	
ASC-H	74.5%	
LSIL	77.1%	
†Low education level		
Benign epithelial/Infectious alterations	75.4%	0.057
ASCUS	73.7%	
ASC-H	88.1%	
LSIL	76.7%	
Smoking habit		0.888
Benign epithelial/Infectious alterations	2.6%	
ASCUS	2.7%	
ASC-H	2.1%	
LSIL	2.9%	

*p<0.05 indicates statistical significance.
†Low education level refers to the primary school education and lack of education.

Discussion

Cervical cancer has a long pre-invasive phase. That is why early detection of pre-invasive cervical neoplasias by population-based cervical cytological screening programs and their appropriate management can reduce the rate of invasive cervical cancer. Thanks to the availability of population-based screening programs, the worldwide prevalence of pre-invasive cervical neoplasia doubled and the prevalence of cervical carcinoma decreased during the 2000's [1, 2].

The relevant clinical studies report that the prevalence of cervical cytological abnormalities varies between 1.5% and 3.2% in developed countries. For instance, the prevalence of ASC-US, LSIL, HSIL, and AGC in the United States of America (USA) have been documented as 3.5%, 2.1%, 0.5% and 0.2% respectively [1, 2, 8].

As shown by Table 3, the prevalence of cervical cytological abnormalities has been reported to be much lower in Turkey, pointing to a value between 1.8% and 2.8%. The prevalence of ASC-US differs between 0.8% and 1.9% while the prevalence of LSIL alters between 0.3% and 0.5% and the prevalence of HSIL was about 0.1% to 0.2% in different geographical regions of Turkey [3-7].

Similarly, the present study has reported a value of 1.0% for the overall prevalence of cervical cytological abnormalities. Moreover benign epithelial alterations, infectious changes, ASCUS, ASC-H and LSIL were detected in 83.7%, 15.3%, 0.8%, 0.1%, and 0.1% of the acquired Pap smears respectively. However, AGC, HSIL, SCC, and cervical adenocarcinoma were not diagnosed in any of the reviewed patients.

Table 3. Prevalence of cervical cytological abnormalities in Turkey

Study Location [Reference]	Study Group (n)	Overall cytological abnormality	ASCUS	LSIL	HSIL	Cancer
Mersin [2]	1032	2.5	1.7	0.5	0.1	0.07
Zonguldak [3]	11539	1.8	1.2	0.3	0.2	0.03
Giresun [4]	32578	1.8	1.2	0.4	0.2	0.03
Istanbul [5]	32026	2.8	1.9	0.5	0.1	0.01
Turkey [6]	140334	1.8	1.1	0.3	0.2	0.06
Current study	3000	1.0	0.8	0.1	-	-

When compared with the findings of the clinical studies that were conducted in Europe and North America, the overall prevalence of abnormal cervical cytology was found to be 2 to 5 times lower in our country. What is more, the prevalence of certain cervical cytological abnormalities (such as ASCUS, LSIL, and HSIL) is much lower in Turkey than in the USA and European countries [1-8]. However, our results are similar to those previously reported from Turkey and other Islamic countries with similar cultural characteristics, such as Egypt, Iran,

and Saudi Arabia [10-12].

It is well known that the prevalence of pre-invasive and invasive abnormal cervical cytology varies according to the demographic and cultural characteristics of the patient populations. Another confounding factor is the diagnostic criteria and techniques that are utilized by the pathologists or cytopathologists [7-9].

The obvious discrepancy between the Turkish and western studies may be attributed to the conservative culture or moderately religious practice of the Turkish population. Another factor may be the significantly lower prevalence of HPV in Turkey [13, 14].

The ASCUS/SIL ratio is a useful tool for the assessment and measurement of intra-laboratory and inter-laboratory comparison. It is well known that the prevalence rates for both ASCUS and SIL are dependent on the risk factors of the patient population, and the ASCUS/SIL ratio provides some degree of correction. The ASCUS/SIL ratio changed from 0.58 to 1.02 for the HPV positive samples in an American study [15].

The study conducted by the Turkish Cervical Cancer and Cervical Cytology Research Group indicated a value of 2.0 for ASCUS/SIL ratio, which is similar to the ASCUS/SIL values achieved by the studies in the USA. The Research Group concluded that the quality of the Turkish laboratories was comparable to that of western laboratories [7]. However, the findings of the present study shows a value of 8.0 for ASCUS/SIL ratio, which is much higher than those reported in the literature. This contradictory result suggests a suspicion about quality and sufficiency of the pathology laboratory, which is located within a tertiary health care center in a southeastern province of Turkey. A body of evidence supporting this hypothesis is the lack of AGC, HSIL, and cervical carcinoma in Pap smears.

The higher ASCUS/SIL ratio indicated by the present study may be primarily related to financial issues and the lack of adequate infrastructure and training at cytology laboratories. That is, a minority of pathology laboratories (approximately 6%) in Turkey have adopted liquid-based cytology, which is claimed to be more sensitive than conventional Pap smear [5, 6]. However, a recent meta-analysis showed that liquid-based cytology is no better than conventional cytology in terms of identifying cytological abnormalities [16]. Therefore, the adoption of conventional cytological methods by the study center in the present study does not explain the relatively high ASCUS/SIL ratio.

Another explanation for the relatively high ASCUS/SIL ratio may be the differences in the demographic and clinical characteristics of the patient populations. However, the demographic and clinical features of the reviewed patients in the present study strongly resemble those of the patients who were reviewed by the Turkish Cervical Cancer and Cervical Cytology Research Group. The other factors which might have impacted the accuracy of the present study are the relatively small size of the study group and the retrospective design of the present study.

The data documented by the present study can be used as adjunct while a national policy for cervical screening programs and HPV vaccination is being constructed in Turkey. Rather than being dependent on the data reported by the clinical studies that have been conducted in western countries, Turkish health care policy should be based on the data obtained from national studies. The data obtained from these studies would enable the development of policies and procedures that are more reliable and suitable for the Turkish population. Besides, other countries with similar social, economic and cultural characteristics would be able to benefit from these data. Further prospective studies are needed to determine the prevalence of cervical cytological abnormalities including pre-invasive and invasive neoplasias in Turkey.

Competing interests

The authors declare that they have no competing interests.

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